

Pursuant to the election made on July 12, 2004 to restrict the claims of the present application to those of Group I, the pending claims are claims 1, 4-7, 10-14, 24-27, 32, 35-38 and 43-49..

List of Claims

1. An isolated nucleic acid encoding a polypeptide comprising an alpha subunit forming a eag-like potassium channel having the characteristic of slowly activated outward rectification selected from the group consisting of *elk1*, *elk2* and *eag2*.
2. (Cancelled)
3. (Cancelled)
4. The isolated nucleic acid according to claim 21 wherein the activation time constant for outward rectification is 676 ± 37 ms at 0 mV with a threshold activation at -40 mV at about pH 7.
5. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes a polypeptide having a molecular weight of between 100 to 150 kDa.
6. The isolated nucleic acid of claim 1, wherein the polypeptide has a molecular weight of about 123 kDa.
7. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes human *elk1*.
8. (Cancelled)
9. (Cancelled)
10. The isolated nucleic acid of claim 1, wherein the nucleic acid encodes human *eag2*.
11. The isolated nucleic acid sequence of claim 7, wherein the nucleic acid has a nucleotide sequence of SEQ ID No:1.
12. The isolated nucleic acid sequence of claim 87 wherein the nucleic acid is at least 80% homologous to SEQ ID NO:1.
13. The isolated nucleic acid of claim 7, wherein the nucleic acid is isolated from superior cervical ganglia, coeliac ganglia, superior mesenteric ganglia, foetal brain, adrenal or stellate ganglia by PCR using primers that selectively hybridize under stringent hybridization conditions to a pair of primers:
5' TTY AAR RCN RYN TGG GAY TGG 3' (SEQ ID No:5) and

3' RTA CCA DAT RCA NGC NAG CCA RTG 5' (SEQ ID No:6)

and amplified using a pair of primers:

5' CGG GAT CCT TGT GGA CAA AC 3' (SEQ ID NO:7)

3' TTC AGG AAT GAC AAC CAG GC 5' (SEQ ID NO:8)..

14. The isolated nucleic acid of claim 8 7 encoding a polypeptide and specifically hybridizes under stringent conditions to SEQ ID No:1.

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. The isolated nucleic acid of claim ~~48~~ 14, wherein the nucleic acid is isolated from brain tissue by PCR using primers that selectively hybridize under stringent hybridization conditions to a pair of primers:

5' TTY AAR RCN RYN TGG GAY TGG 3' (SEQ ID No:5) and

3' RTA CCA DAT RCA NGC NAG CCA RTG 5' (SEQ ID No:6)

and amplified by PCR using a pair of primers:

5' CGG GAT CCT TGT GGA CAA AC 3' (SEQ ID NO:7)

3' TTC AGG AAT GAC AAC CAG GC 5' (SEQ ID NO:8).

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled).

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. An expression vector comprising the nucleic acid of claim 1.

33. (Cancelled)

34. (Cancelled)
35. An expression vector comprising the nucleic acid of claim 6.
36. An expression vector comprising the nucleic acid of claim 7.
37. (Cancelled)
38. (Cancelled)
39. (Cancelled)
40. (Cancelled)
41. (Cancelled)
42. (Cancelled)
43. A host cell transfected with the vector of claim 35.
44. A host cell transfected with the vector of claim 36.
45. (Cancelled)
46. A method for identifying a compound that modulates ion flux through a slowly activated outward rectifier potassium channel selected from the group consisting of elk1, elk2, eag2, the method comprising the steps of:
 - (i) contacting the compound with a eukaryotic host cell or cell membrane in which has been expressed a polypeptide forming a potassium channel having the characteristic of slowly activated outward rectification;
and
 - (ii) determining the functional effect of the compound upon the cell or cell membrane expressing the potassium channel.
47. The method of claim ~~3846~~, wherein the eukaryotic host cell is *Xenopus* oocyte.
48. The method of claim ~~3846~~, wherein the functional effect is determined by measuring changes in current or voltage.
49. The method of claim ~~3846~~, wherein the potassium channel polypeptide is recombinantly expressed.
50. to 68. (Cancelled)